

**WE CLAIM:**

1           1.    A method for enabling location independent and location  
2   transparent interaction between a program and a user, the program  
3   having been launched at a first location and having a program state  
4   data structure for storing at least the program state, the method  
5   comprising the steps of:

6           initiating a program status request by the user;  
7           determining the current location of the program;  
8           checking the program state to ascertain program status; and  
9           interacting with said program based upon said program status.

1           2.    The method of Claim 1 wherein said interacting with said  
2   program comprises:

3           retrieving, from the program, output contents to display to  
4   the user; and  
5           displaying the output contents to said user.

1           3.    The method of Claim 1 wherein said interacting with said  
2   program comprises:

3           requesting input variables from said user;  
4           sending any received input values to the current location; and  
5           incorporating the received input values into said program  
6   state data structure.

1           4.    The method of Claim 1 wherein the program is a mobile  
2   agent.

1           5.    The method of Claim 1 wherein the program is a mobile  
2 script.

1           6.    The method of Claim 1 where the user is a mobile user.

1           7.    The method of Claim 2 further comprising the step of  
2 maintaining an output buffer and wherein said retrieving comprises  
3 the step of retrieving the output contents from said output buffer.

1           8.    The method of Claim 1 wherein the initiating step  
2 comprises the steps of:

3                initiating the status request at a client machine; and  
4                forwarding the status request to the first location at which  
5 said program was launched.

1           9.    The method of Claim 8 wherein said program comprises a  
2 mobile program which executes a portion of its code at each of a  
3 plurality of execution servers and wherein the determining step  
4 comprises the steps of:

5                transmitting the status request to each execution server at  
6 which the program has executed a portion of its code; and

7                determining, at each execution server, whether the program is  
8 currently running locally.

1           10.   The method of Claim 9 wherein each of said plurality of  
2 execution servers maintains routing information for said program

3 and wherein said determining further comprises the step, if said  
4 program is not currently running locally, of consulting said  
5 routing information to ascertain at least one successive execution  
6 server to which the program has been routed.

1 11. A method for enabling a user to provide input values to  
2 a running program before the program needs the input values,  
3 comprising the steps of:

4 maintaining a bag buffer of variable/value pairs in the  
5 program;

6 receiving a communication, including input values, from the  
7 user; and

8 temporarily storing said input values in said bag buffer.

1 12. The method of Claim 11 wherein said program subsequently  
2 searches through contents of the bag buffer to locate needed input  
3 values before requesting input from said user.

1 13. The method of Claim 2 further comprising the step of  
2 maintaining a bag buffer in the program and wherein the retrieving  
3 step comprises the steps of:

4 searching, in the bag buffer, for input values associated with  
5 the input variables;

6 updating, if found, the input variables with the input values;

7 disposing, in an input buffer, the input variables, if not  
8 found; and

9 optionally notifying the user via electronic means if no  
10 suitable values are found in the bag buffer.

1 14. The method of Claim 13 wherein the electronic means is a  
2 pager.

1 15. The method of Claim 13 wherein the electronic means is a  
2 beeper.

1 16. The method of Claim 13 wherein the electronic means is  
2 electronic mail.

1 17. The method of Claim 13 wherein the electronic means is a  
2 smart telephone.

1 18. A computer program data structure comprising;  
2 an output buffer for storing output values to be displayed to  
3 a user;  
4 an input buffer for storing values for which user input of  
5 variables is required; and  
6 a program state buffer for storing at least the present state  
7 of said program.

1 19. The data structure of Claim 18 further comprising a bag  
2 buffer for storing input variables.

1           20. The data structure of Claim 19 wherein the bag buffer is  
2 a array data structure.

1           21. The data structure of Claim 19 wherein the bag buffer is  
2 a hash table data structure.

1           22. The data structure of Claim 19 wherein the bag buffer is  
2 a tuple space data structure.

1           23. An execution shell for a mobile program comprising:  
2 a routing component for maintaining routing information  
3 regarding said mobile program;  
4 a processor component for processing user status requests  
5 related to said program; and  
6 an execution component for executing at least part of said  
7 program.

1           24. The execution shell of Claim 23 further comprising a data  
2 handling component for receiving user input and storing same in at  
3 least one data structure for said program.